Appendix A

Permit Authority, Mitigation Measures, Management Actions, Standards Conditions of Approval, and Programmatic Mitigation

Appendix A — Permit Authority, Mitigation Measures, Management Actions, Standards Conditions of Approval, and Programmatic Mitigation

This appendix contains details about authorities for permitting various aspects of the PRB Oil and Gas Project (Section A.1), mitigation measures (Section A.2, management actions for implementing the project (Section A.3), standard COAs (Section A.4) and programmatic mitigation (Section A.5).

A.1 Permit Authority

Table A–1 identifies the major federal and state permits, approvals, and consultations potentially required for the PRB Oil and Gas Project.

Table A–1 Major Federal and State Permits, Approvals, and Consultations Potentially Required for the PRB Oil and Gas Project

Issuing Agency/Permit Approval Name	Nature of Regulatory Action	Applicable Project Component
Federal Permits, Approvals, and Authorizing Actions		
USDI – Bureau of Land Management		
Permit to Drill, Deepen, or Plug Back (APD), CBM Plan of Development (POD), and Sundry Notice, produced water disposal, plugging and abandonment, venting, and flaring	Controls drilling and production for oil and gas on federal onshore leases.	Wells, roads, on lease impoundments, production facilities, and all surface disturbing activities.
Rights-of-Way Grant and Temporary Use Permit	Right-of-way grant on BLM-managed lands.	Oil and gas pipelines, roads, facilities, and ancillary structures on off-lease BLM-managed lands.
Cultural Resource Use Permit	Archaeological surveys and limited testing on public lands. Archaeological data recovery (excavation) of sites on public lands.	All surface-disturbing activities.
Pesticide Use Permit	Control of pests.	Wells, roads, and ancillary facilities.
National Noxious Weed Act Compliance	Controls noxious weeds.	Any occurrence of noxious weeds on or near project facilities.
Material Sales	Sales of sand, gravel, and riprap.	Construction activities
USDA – Forest Service		
Special Use Permit, Surface Use Program of APD	Surface disturbance on FS-managed lands.	Wells, roads, pipelines, and facilities on FS-managed lands.
Special Use Permit (Cultural Resources)	Archaeological surveys and limited testing on public lands. Archaeological data recovery (excavation) of sites on public lands.	All surface-disturbing activities.
USDI Fish and Wildlife Service		
Endangered Species Act Compliance (Section 7)	Protects threatened and endangered species.	Any activity potentially affecting species listed as or proposed for listing as threatened or endangered.
Migratory Bird Treaty Act	Protects migratory birds.	All surface-disturbing activities.
Bald Eagle Protection Act	Protects bald and golden eagles.	All surface-disturbing activities.
Advisory Council on Historic Preservation		
Cultural Resource Compliance (Section 106)	Protects cultural and historic resources. Coordinated with the Wyoming State Historic Preservation Officer (SHPO).	All surface-disturbing activities.
U.S. Department of Army Corps of Engineers		
Permit to Discharge Dredged or Fill Material (Section 404 Permit)[1]	Authorized placement of dredged or fill material in waters of the United States or adjacent wetlands.	All surface-disturbing activities.
U.S. Department of Transportation		
Construction and operation of natural gas pipelines.	Prescribes minimum safety requirements for pipeline facilities and the transportation of gas, including pipeline facilities.	Natural gas pipelines.

Table A–1 Major Federal and State Permits, Approvals, and Consultations Potentially Required for the PRB Oil and Gas Project

Issuing Agency/Permit Approval Name	Nature of Regulatory Action	Applicable Project Component
State Permits, Approvals, and Authorizing Actions		
Wyoming State Engineer's Office		
Permit to Appropriate Ground Water	Registering groundwater rights for all uses, except stock and domestic.	Wells.
Permit to Construct a Reservoir[1]	Ensures the safety and structural integrity of water storage facilities.	Water storage facilities.
Certification by a Wyoming-licensed professional engineer	Required for dams greater than 20 feet in height with a storage capacity of 50 acre-feet or more.	Water storage facilities.
Permit to Appropriate Surface Water	Applications for any request for putting surface waters of the state to a beneficial use.	Facilities to transport or store surface waters.
Permit for Land Application of Produced Water[1]	Authorizes the application of produced water to lands for disposal.	Land Application Disposal facilities.
Permit to Appropriate By-product Water for Additional Beneficial Uses	Authorizes the use of by-product water for beneficial uses.	Facilities to dispose of produced water when used for additional beneficial uses, such as stock watering.
Wyoming Department of Environmental Quality		
National Pollutant Discharge Elimination System (NPDES) Individual Coal Bed Methane Permit	Authorizes discharge of produced water to surface waters of the state.	Any point-source surface discharge.
NPDES General Permit for Storm Water Discharges	Controls discharge of storm water pollutants associated with industrial and construction activities.	Construction that disturbs 5 or more surface acres of land and gas production facilities that have had a discharge of a reportable quantity
New Source Review (NSR) Permit	Controls emissions from new or modified sources.	All polluting emission sources, including compressor engines and portable diesel and gas generators.
Fugitive Dust Control	Control fugitive dust emissions to comply with Wyoming Air Quality Standards and Regulations Chap. 3, Sec. 2(f).	Construction of facilities and vehicle traffic.
Wyoming Department of Transportation		
Access Permit	Authorizes access roads tying into state or federal highways.	All project roads
Wyoming Oil and Gas Conservation Commission		
Permit to Use and Construct Earthen Pit for Temporary Use or for Reserve Pit	Authorizes the construction and use of an earthen pit for oil and gas wells.	Oil and gas wells.
Permit to Drill/Deepen/Plug Back	Authorizes the drilling, deepening, or plugging of oil and gas wells.	Oil and gas wells.
Permit to Use and Construct Earthen Pit for Retention of Produced Water	Authorizes the construction and use of an earthen pit for the storage and evaporation of produced water.	Oil and gas wells.

Table A–1 Major Federal and State Permits, Approvals, and Consultations Potentially Required for the PRB Oil and Gas Project

Issuing Agency/Permit Approval Name	Nature of Regulatory Action	Applicable Project Component
Wyoming State Historic Preservation Office		
Section 106 Cultural Resource Consultation	Determines significance of cultural resources potentially affected by surface-disturbing activities.	All surface-disturbing activities.

Note:
1. BLM also has authority for these approvals on federal leases through APDs/PODs ensure compliance with regulations and on-shore order #7.

A.2 Mitigation Measures

Table A–2 displays the possible mitigation measures as they appeared in Chapter 4 of the FEIS. This table has been included here to help the public understand who has the authority to apply these measures. There is overlapping authority between agencies on many of these measures. State of Wyoming is not issuing a ROD. Therefore, the mitigation measures shown with Wyoming authority/ responsibility may or may not be required by the State but could be applied if they determine them to be necessary.

Mitigation measures in Table A-2 that have not been adopted are shown with an asterisk, the remainder have been adopted. The numbering in the Table corresponds to the numbering in Chapter 4 of the FEIS. Some of those adopted, have been clarified based on comments received during the protest period. Some of the adopted mitigation measures shown in Table A-2, have been determined to be either Standard COA, Management Actions or Programmatic Mitigation. The clarified adopted measures are segregated into two sections and are found under the headings: A.4 Standard Conditions of Approval and A.5 Programmatic Mitigation. The numbering in sections A.4 and A.5 does not correspond with the numbering in Table A-2.

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
1. Concerns exist about the interaction between reservoirs and shallow groundwater. At impoundment locations, it may be necessary to conduct investigations at representative sites around the basin to quantify impacts of water infiltration and lateral movement. Shallow groundwater wells will be installed and regularly sampled in areas where it has been determined during pre-construction that class 1 groundwater may be affected by infiltration or potential for lateral movement exists.	✓	✓	✓	
2. Channel crossings by pipelines will be constructed so that the pipe is buried at least four feet below the channel bottom.	✓	✓		
3. Channel crossings by road and pipelines will be constructed perpendicular to flow. Culverts will be installed at appropriate locations for streams and channels crossed by roads as specified in the BLM Manual 9112-Bridges and Major Culverts and Manual 9113-Roads. Streams will be crossed perpendicular to flow, where possible, and all stream crossing structures will be designed to carry the 25-year discharge event or other capacities as directed by the BLM.	✓	✓		
4. *Disturbed channel beds will be reshaped to their approximate original configuration and stabilized by appropriate means.	✓	✓	✓	

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
5. *Areas where natural springs are present, operators will be required to identify, inventory, and monitor these springs as part of their water management plan development.	✓	✓	✓	
6. Concerns regarding the quality of the discharged CBM water for irrigation use may require operators to increase the amount of storage of CBM water during the irrigation months and allow more surface discharge during the non-irrigation months.			✓	✓[1]
7. *Concerns regarding the potential for discharges of CBM water to reach the main stems will be minimized by locating discharge outfalls higher in ephemeral and intermittent drainages or near the drainage divide.	✓	✓	✓	
8. *Land application of produced water has the potential to produce negative, long term impacts to soil physical and chemical properties if not properly managed. Proposals to land apply CBM produced water on federal projects must include the following information as part of the exploratory and/or permanent water management plans:	✓	✓		
Site characterization: The site characterization must include field investigations of soils and vegetation. The site will be described in detail, and soil samples will be collected and analyzed to determine important soil chemical and physical properties. Site descriptions will include maps, vegetation descriptions, soils descriptions, laboratory analysis and location of proposed application sites. Photo documentation of the site will be included. Laboratory analysis of produced water will also be included with the site characterization study.	✓	✓		
Project description: The project description must include the proposed method(s) of water application, application rates and schedules and physical layout of application areas. Complete maps of the application infrastructure will be included. Details on any soil or water amendments that will be used or physical soil manipulations that will be planned. Project descriptions will demonstrate that land application is feasible given the results of the site characterization.	✓	✓		
Monitoring Plan: Periodic monitoring of soils and vegetation will be required of the operator to assure that negative impacts are not occurring, or are being remediated. Monitoring must include soil sampling and laboratory analysis.	✓	✓		
Winter operations: Detail practices that will be used to prevent the buildup of ice on the soil surface during sub freezing temperatures.	✓	✓		

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
Mitigation Plan: A plan must be developed which outlines mitigation measures that will be implemented by the operator in the event negative soils or vegetation impacts are detected during routine monitoring. Potential mitigation measures might include, but not be limited to, soil or water amendments, physical manipulation or vegetative treatments. These criteria are general in nature, and must be adjusted to site-specific conditions. Detailed soil sampling criteria have not yet been developed, so project proposals will be evaluated on a case-by-case basis during the interim. More specific guidance/requirements may be forthcoming as the result on ongoing research and coordination.	✓	✓		
9. *The Companies will segregate soil horizons during excavation of all project facilities and avoid mixing of soil horizons during stockpiling and redistribution of soils.	✓	✓		
10. The Companies will test sediments deposited in impoundments before reclaiming the impoundments. Tests will include the standard suite of cations, ions, and nutrients that will be monitored in surface water testing and any trace metals found in the CBM discharges at concentrations exceeding detectable limits.	✓	✓	✓	
11. The Companies will conduct development in and around the Crazy Woman Battlefield in a way that preserves the eligibility of the site for nomination to the National Register of Historic Places. Approvals of APDs and PODs will require prior coordination with the SHPO and BLM's archaeologists.	✓		✓	
12. For development within 0.25 mile either side of the Bozeman Trail, companies will conduct evaluation of segments to determine their eligibility to the National Register of Historic Places. Mitigation of adverse impacts to segments of the trail that contributes to its eligibility for the NRHP will be determined on a case-by-case basis.	✓		✓	
13. *Should human remains be unearthed during construction, procedures outlined in the human remains plan (Appendix L) will be followed.	✓	✓	✓	
14. *At a minimum, all areas of proposed ground disturbing activity will be intensively inventoried for cultural resources in conformance with minimal BLM Class III survey standards at the APD, POD or Sundry Notice phase of each proposed Federal undertaking. For CBM well fields or PODs, a block survey of the entire project area early in the planning phase is highly recommended by the BLM and is required by the FS. All sites within the proposed project area must be evaluated for eligibility to the NRHP.	✓	✓	✓	

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
Specific plans for avoidance and protection or minimization of adverse direct or indirect effects will be recommended for any historic properties within the areas of potential effect of proposed project activities. Prior to implementation, these plans must be approved by the BLM or FS, as appropriate, SHPO, and, if applicable, by the private surface owner. Such plans might include, but are not limited to the following constraints, stipulations, or actions:	✓	✓	✓	
➢ Relocation, redesign or constraint of project facilities and infrastructure to avoid or minimize earth disturbance within historic properties or contributing portions of historic properties, or to avoid or minimize indirect effects or intrusions caused by vibration, dust, exhaust, or noise. This may include barricading or fencing of sensitive areas and buffer zones.	✓	✓	✓	
➢ Relocation, redesign, or constraint of project facilities and infrastructure to avoid or minimize visual intrusion on a sensitive historic, traditional, or religious setting. This might include low profile facilities, non-intrusive colors, landscaping, berms, screening with vegetation, or other measures to minimize visual impact.	✓	✓	✓	
➢ Stabilization of sediments, bedrock, or structures that could be destabilized, or could deteriorate, as a result of nearby project activities and identification of an appropriate buffer zone.	✓	✓	✓	
➢ Restriction or prevention of access to sensitive areas.	✓	✓	✓	
➢ Rehabilitation of buildings or structures, or protective screening of art work to minimize deterioration.	✓	✓	✓	
➢ Detailed documentation, possibly including archival photodocumentation, of contributing structures, landscape features, or aspects of historic setting that cannot feasibly be avoided. In some cases it may be feasible to restore some of these contributing features after construction has been completed.	✓	✓	✓	
➢ Detailed recordation or data recovery of the essential contributing elements of a historic property that cannot be avoided or protected. Recordation may include archival, documentary, and contextual research related to the historic property in addition to site documentation. Data recovery is the systematic recovery of data important in history or prehistory for which the property is considered eligible. Data recovery for prehistoric or historic archaeological sites typically entails excavation of buried materials and detailed documentation of stratigraphic context.	✓	✓	✓	

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
15. *Companies will be required to submit an integrated pest management plan (Appendix N) as a component of the APD and POD approval process. The components of the integrated pest management plans are outlined in the BFO CBM APD and POD Preparation Guide. Companies will need to contact County Weed and Pest offices to ascertain information about weeds in the area of their APD or POD. Mitigation will be determined on a site-specific basis and may include such measures as spraying herbicides before entering areas and washing vehicles before leaving infested areas.	✓	✓		
16. *Any mulch and seed used for reclamation needs to be certified weed free and current year's tested.	✓	✓	✓	✓
17. Weed educational material will be reviewed with operators during pre-construction on-site meetings with operators, subcontractors, and landowners and will also be attached to approved APDs and PODs.	✓	✓		
18. To protect the biological and hydrologic features of riparian areas, woody draws, wetlands, and floodplains, all well pads, compressors, and other non-linear facilities will be located outside of these areas.	✓	✓		
19. Where riparian areas and special habitat types e.g.cottonwoods have the potential to be inundated with water on a continuous basis, measures will be taken to prevent continual inundation . This may include the use of facilities to handle the water discharged from CBM wells.	✓	✓		
20. Crossings of wetland/riparian areas by linear features, such as pipelines, roads, and power lines will be avoided to the extent practicable. Where crossings cannot be avoided, impacts will be minimized through use of the following measures:	✓	✓		
➢ Site-specific mitigation plans will be developed during the APD, POD, or Sundry Notice approval process for all proposed disturbance to wetland/riparian areas.	✓	✓		
➢ Crossings will be constructed perpendicular to wetland/riparian areas, where practical.	✓	✓		
➢ For power lines, the minimum number of poles necessary to cross the area will be used.	✓	✓		
➢ Wetland areas will be disturbed only during dry conditions (that is, during late summer or fall), or when the ground is frozen during the winter.	✓	✓	✓	✓[2]
➢ No waste material will be deposited below high water lines in riparian areas, flood plains, or in natural drainage ways.	✓	✓	✓	✓[2]
➢ The lower edge of soil or other material stockpiles will be located outside the active floodplain.	✓	✓	✓	✓[2]
➢ Drilling mud pits will be located outside of riparian areas, wetlands, and floodplains, where practical.	✓	✓	✓	✓[2]

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
➢ Disturbed channels will be re-shaped to their approximate original configuration or other geomorphilogical configuration and properly stabilized.	✓	✓	✓	✓[2]
➢ Reclamation of disturbed wetland/riparian areas will begin immediately after project activities are complete.	✓	✓	✓	✓[2]
21. For any surface-disturbing activities proposed in sagebrush shrublands, the Companies will conduct clearance surveys for sage grouse breeding activity during the sage grouse's breeding season before initiating the activities. The surveys must encompass all sagebrush shrublands within 0.5 mile of the proposed activities.	✓	✓		
22. The Companies will locate compressor stations so that noise from the stations at any nearby sage grouse or sharp-tailed grouse display grounds does not exceed 49 decibels (10 dBA above background noise) at the display ground.	✓	✓		
23. The Companies will construct power lines to minimize the potential for raptor collisions with the lines. Potential modifications include burying the lines, avoiding areas of high avian use (for example, wetlands, prairie dog towns, and grouse leks), and increasing the visibility of the individual conductors.	✓	✓		
24. The Companies will locate aboveground power lines, where practical, at least 0.5 mile from any sage grouse breeding or nesting grounds to prevent raptor predation and sage grouse collision with the conductors. Power poles within 0.5 mile of any sage grouse breeding ground will be raptor-proofed to prevent raptors from perching on the poles.	✓	✓		
25. The Companies will locate impoundments to avoid sagebrush shrublands, where practical.	✓	✓		
26. Containment impoundments will be fenced to exclude wildlife and livestock. If they are not fenced, they will be designed and constructed to prevent entrapment and drowning.	✓	✓		
27. The Companies will limit the construction of aboveground power lines near streams, water bodies, and wetlands to minimize the potential for waterfowl colliding with power lines.	✓	✓		
28. In ponds developed where the primary objective is as a fishery, water quality will be sampled by the Companies on an annual basis for selenium, TDS, salinity, temperature, pH, dissolved oxygen, and sodium bicarbonate.	✓	✓		
29. The Companies will fence impoundments in areas that are developed for fisheries to exclude livestock, if agreed upon with the landowner.	✓	✓		

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other

30. *Stream channel monitoring for erosion, degradation, and riparian health will be conducted on an annual basis. Surveys will include no less than one stream reach above all CBM discharges and several stream reaches below CBM discharges. Where monitoring occurs, a station will be placed above all CBM outfalls and one below all CBM outfalls, at least on main stems.

31. *Sub-watersheds that will receive CBM produced waters and will be monitored for macroinvertebrates and fish populations include: Upper Tongue River, Upper Powder River, Salt Creek, Crazy Woman Creek, Clear Creek, Middle Powder River, Little Powder River, Antelope Creek, Upper Cheyenne River, and Upper Belle Fourche River. Sampling sites will be established at existing flow and water quality monitoring stations where possible. Sampling will occur on an annual basis during low-flow periods, and all data collected will be entered into a central database. Collected data may include species occurrence, species count, population demographics, and water quality and quantity measures. Fish samples may be collected and submitted for chemical analysis. Results of this analysis could be used to evaluate specific analyte concentrations in fish tissues and appropriate toxicological benchmarks. At least two sampling locations per stream or river will be established in these watersheds:

    - Upper Tongue River – (1) between the Wyoming/Montana border and below all CBM discharge points; and (2) above CBM discharge points.
    - Upper Powder River – (1) above Clear Creek at confluence; (2) above Crazy Woman Creek at confluence; (3) below Salt Creek at confluence; and (4) below other tributaries that may contribute flow to the Upper Powder River.
    - Salt Creek – (1) above Upper Powder River at confluence; and (2) above CBM discharge points.
    - Crazy Woman Creek – (1) above Upper Powder River at confluence; (2) above CBM discharge points; and (3) below other tributaries that may contribute flow to Crazy Woman Creek.
    - Clear Creek – (1) above Upper Powder River at confluence; (2) above CBM discharge points; and (3) below other tributaries that may contribute flow to Clear Creek.
    - Middle Powder River – (1) between the Wyoming/Montana border and below all CBM discharge points; and (2) below confluence of Upper Powder River and Clear Creek.
    - Little Powder River – (1) between the Wyoming/Montana border and below all CBM discharge points; (2) above CBM discharge points; and (3) below other tributaries that may contribute flow to the Little Powder River.

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
➢ Antelope Creek – (1) between eastern boundary of the Project Area and below all CBM discharge points; (2) above CBM discharge points; and (3) below other tributaries that may contribute flow to Antelope Creek.				
➢ Upper Cheyenne River – (1) between eastern boundary of the Project Area and below all CBM discharge points; (2) above CBM discharge points; and (3) below other tributaries that may contribute flow to the Upper Cheyenne River.				
➢ Upper Belle Fourche River – (1) between Campbell/Crook County line and below all CBM discharge points; (2) above CBM discharge points; and (3) below other tributaries that may contribute flow to the Upper Belle Fourche River.				
➢ A minimum of 21 sites (as above) will need to be sampled on an annual basis to monitor aquatic health within the Project Area.				
32. The Companies will conduct clearance surveys for threatened, endangered or other special-concern species at the optimum time. Inventory for special concern species is contingent upon landowner concurrence. This will require coordination with the BLM before November 1 annually to review the potential for disturbance and to agree on inventory parameters.	✓	✓		✓[3]
33. In the event that a bald eagle (dead or injured) is located during construction or operation, the USFWS' Wyoming Field Office (307-772-2374) and the USFWS' Law Enforcement Office (307-261-6365) will be notified within 24 hours.	✓	✓		✓[3]
34. Site-specific project areas will be evaluated for suitable bald eagle nesting and roosting habitat prior to permit approval. Suitable nesting habitat is any mature stand of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes or any significant body of water. Suitable roosting habitat is defined as any mature stands of conifer or cottonwood trees.	✓	✓		✓[3]

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
35. The BLM will monitor all take of bald eagle habitat associated with the preferred alternative. The actual measurement of disturbed habitat is the responsibility of BLM but can be delegated to BLM' agent (consultant, contractor, etc.) A written summary will be provided to the USFWS' Wyoming Field Office semi-annually. The semi-annual report will include field survey reports for endangered, threatened, proposed and candidate species for all actions covered under the *Environmental Impact Statement (EIS) for the Powder River Basin Oil and Gas Project* and ROD. The semi-annual reports will include all actions completed up to 30 days prior to the reporting dates. The first report will be due 6 months after the signing of the ROD and on the anniversary date of the signing of the ROD. Reporting will continue for the life of the project.	✓	✓		✓[3]
36. The BLM will monitor all road-associated carcasses, jackrabbit sized and larger, along project (operator-maintained) roads.	✓	✓		✓[3]
37. All power lines will be built to protect raptors, including wintering bald eagles, from accidental electrocution using methods detailed by the Avian Power Line Interaction Committee (1996).	✓	✓		✓[3]
38. Special habitats for raptors, including wintering bald eagles, will be identified and considered during the review of the APD/POD or Sundry Notices.	✓	✓		✓[3]
39. Surveys for active bald eagle nests and winter roost sites will be conducted within suitable habitat by a BLM approved biologist. Surface disturbing activities will not be permitted within one mile of suitable habitat prior to survey completion.	✓	✓		✓[3]
40. A minimum disturbance-free buffer zone of 0.5 mile (i.e., no surface occupancy) will be established year-round for all bald eagle nest sites. A seasonal minimum disturbance-free buffer zone of one mile will be established for all bald eagle nest sites (February 15 – August 15).	✓	✓		✓[3]
41. A seasonal minimum disturbance-free buffer zone of 1 mile will be established for all bald eagle winter roost sites (November 1 – April 1). These buffer zones and timing may be adjusted based on site-specific information through coordination with, and written approval from, the USFWS.	✓	✓		✓[3]
42. Within ½ mile of bald eagle winter roost sites additional measures such as remote monitoring and restricting maintenance visitation to between 9:00 and 3:00 may be necessary to prevent disturbance (November 1 – April 1).	✓	✓		✓[3]
43. Maximum design speed on all operator constructed and maintained roads will not exceed 25 miles per hour to minimize the chance of a collision with a bald eagle, other wildlife, or livestock.	✓	✓		✓[3]

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
44. Additional mitigation measures may be necessary if the site-specific project is determined by a BLM biologist to have adverse effects to bald eagles or their habitat.	✓	✓		✓[3]
45. Site-specific project areas will be evaluated for suitable black-footed ferret habitat prior to permit approval. Suitable habitat consists of a black-tailed prairie dog town or complex greater than 80 acres (USFWS 1989). A prairie dog town is a group of intact prairie dog holes whose density exceeds 8 burrows/acre; a complex consists of two or more neighboring prairie dog towns each less than 4.34 miles (7 kilometers) from the other (USFWS 1989).	✓	✓		✓[3]
46. Prairie dog colonies will be avoided wherever possible.	✓	✓		✓[3]
47. If suitable prairie dog colonies cannot be avoided, surveys will be conducted in compliance with the USFWS guidelines (USFWS 1989). The entire colony or colony complex affected will be surveyed, even if part of the colony has a burrow density below eight per acre.	✓	✓		✓[3]
48. If any black-footed ferrets are located, the USFWS will be consulted. Absolutely no disturbance will be allowed within prairie dog colonies inhabited by black-footed ferrets.	✓	✓		✓[3]
49. Additional mitigation measure may be necessary if the site-specific project is determined by a BLM biologist to have adverse effects to black-footed ferrets or their habitat.	✓	✓		✓[3]
50. Site-specific project areas will be evaluated for suitable mountain plover nesting habitat prior to permit approval. Flat areas of short-grass prairie or low shrubs with a prevalence of bare ground characterize suitable mountain plover nesting habitat. Typically the vegetation height is less than 4 inches, and bare ground is greater than 30 percent. In the event that a mountain plover is located during construction or operation, the USFWS' Wyoming Field Office (307-772-2374) and the USFWS' Law Enforcement Office (307-261-6365) will be notified within 24 hours.	✓	✓		✓[3]
51. The BLM will monitor all take of mountain plover habitat associated with the preferred alternative. The actual measurement of disturbed habitat is the responsibility of BLM but can be delegated to BLM' agent (consultant, contractor, etc.) A written summary will be provided to the USFWS' Wyoming Field Office semi-annually. The semi-annual report will include field survey reports for endangered, threatened, proposed and candidate species for all actions covered under the *Environmental Impact Statement (EIS) for the Powder River Basin Oil and Gas Project* and ROD. The semi-annual reports will include all actions completed up to 30 days prior to the reporting dates. The first report will be due 6 months after the signing of the ROD and on the anniversary date of the signing of the ROD. Reporting will continue for the life of the project.	✓	✓		✓[3]

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
52. No ground-disturbing activities will occur in suitable nesting habitat prior to surveys for nesting mountain plovers conducted in compliance with the USFWS' Mountain Plover Survey Guidelines (USFWS 2002). A BLM approved biologist will conduct the surveys. Once occupied mountain plover nesting habitat is located, the BLM will reinitiate section 7 consultation with the USFWS on any project-related activities proposed for such habitat. The amount and nature of ground-disturbing activities will be limited within identified nesting areas in a manner to avoid the abandonment of these areas.	✓	✓		✓[3]
53. Operators and the BLM will be provided by the USFWS with educational material illustrating and describing the mountain plover, its habitat needs, life history, threats, and gas development activities that may lead to incidental take of eggs, chicks, or adults with requirements that these materials be posted in common areas and circulated in a memorandum among all employees and service providers.	✓	✓		✓[3]
54. A disturbance-free buffer zone of 0.25 mile will be established around all mountain plover nesting locations between March 15 and July 31.	✓	✓		✓[3]
55. Project-related features that encourage or enhance the hunting efficiency of predators of mountain plover will not be constructed within ¼ mile of known mountain plover nest sites.	✓	✓		✓[3]
56. Construction of ancillary facilities (for example, compressor stations, processing plants) will not be located within ½ mile of known nesting areas. The threats of vehicle collision to adult plovers and their broods will be minimized, especially within breeding aggregation areas.	✓	✓		✓[3]
57. Where possible, roads will be located outside of plover nesting areas. Maximum allowed travel speed on roads within ½ mile of identified plover nesting areas will not exceed 25 mph from March 15 and July 31.	✓	✓		✓[3]
58. Maximum design speed on all operator-constructed and maintained roads will not exceed 25 miles per hour.	✓	✓		✓[3]
59. Work schedules and shift changes will be set to avoid the periods from 30 minutes before to 30 minutes after sunrise and sunset during June and July, when mountain plovers and other wildlife are most active.	✓	✓		✓[3]
60. The BLM will monitor all road-associated carcasses, jackrabbit sized and larger, along project (operator-maintained) roads. The presence of carrion could attract mountain plover predators.	✓	✓		✓[3]
61. Creation of hunting perches or nest sites for avian predators within 0.5 mile of identified nesting areas will be avoided by burying powerlines, using the lowest possible structures for fences and other structures and by incorporating perch-inhibiting devices into their design.	✓	✓		✓[3]

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
62. When above ground markers are used on capped and abandoned wells they will be identified with markers no taller than four feet with perch inhibiting devices on the top to avoid creation of raptor hunting perches within 0.5 mile of nesting areas.	✓	✓		✓[3]
63. Reclamation of areas of previously suitable mountain plover habitat will include the seeding of vegetation to produce suitable habitat for mountain plover.	✓	✓		✓[3]
64. Site-specific project areas will be evaluated for suitable Ute ladies'-tresses orchid habitat prior to permit approval. Suitable habitat is characterized by moist soils near springs, lakes, or perennial streams; most occurrences are in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows in the floodplains of perennial streams (USFWS 1995).	✓	✓		✓[3]
65. Suitable habitat will be avoided wherever possible.	✓	✓		✓[3]
66. If suitable habitat for Ute ladies'-tresses cannot be avoided, surveys will be conducted in compliance with USFWS standards (USFWS 1995) by a BLM approved biologist or botanist. Surveys can only be conducted between July 20 and August 31.	✓	✓		✓[3]
67. Moist soils near wetlands, streams, lakes, or springs in the project area will be promptly revegetated if construction activities impact the vegetation in these areas. Revegetation will be designed to avoid the establishment of noxious weeds.	✓	✓		
68. Companies operating in areas identified with weed infestations or suitable Ute ladies'- tresses orchid habitat will be required to submit an integrated pest management plan prior to APD approval. The components of the integrated pest management plans are outlined in the CBM APD and POD Preparation Guide. Mitigation will be determined on a site-specific basis and may include such measures as spraying herbicides prior to entering areas and washing vehicles before leaving infested areas. Infestation areas of noxious weeds have been identified through the county Weed and Pest Districts and are available at the Buffalo BLM office.	✓	✓		✓[3]
69. The Companies will use gravel, water, or other dust suppressors, as needed, to reduce dust associated with facility access roads. Companies will contact the counties to ascertain the procedures to be followed.	✓	✓		✓[4]
70. The Companies will provide georeferenced spatial data depicting as-built locations of all facilities, wells, roads, pipelines, power lines, reservoirs, discharge points, and other related facilities to the BLM upon completion of POD construction and development.	✓			

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
71. Companies will contact the counties to pursue development of maintenance agreements to ensure county roads are adequately maintained for the projected increase in use.				✓[4]
72. The Companies will complete the following measures, where practical: use existing well pads where feasible, use vegetative and topographic screening when siting well locations and avoid highwall cuts.	✓			
73. Within the designated VRM Class II corridors along Interstate 90 and State Highway 14, all project facilities on BLM surface will be screened completely from these highways or camouflaged to retain basic elements of form, line, color and texture of the landscape. .	✓			
74. The Companies will mount lights at compressor stations on a pole or building and direct them downward to illuminate key areas within the facility while minimizing the amount of light projected outside the facility.	✓			
75. *Increase the distance between a CBM facility and an existing noise-sensitive receptor (residences, schools, medical facilities, and recreational areas). As shown in the analysis, noise decreases by 6 dBA with every doubling of distance from a source. For instance, if the noise were 65 dBA at 100 feet from a CBM source, the noise will decrease to 59 dBA at 200 feet from the source and to 47 dBA at 800 feet from the source.				
76. Noise mufflers will be installed on the exhaust of compressor engines to reduce the exhaust noise.	✓			
77. Where noise impacts to existing sensitive receptors are an issue, noise levels will be required to be no greater than 55 decibels measured at a distance of one-quarter mile from the appropriate booster (field) compressor. When background noise exceeds 55dBA, noise levels will be no greater than 5dBA above background. This may require the installation of an electrical compressor motors at these locations.	✓			
78. *Noise can be reduced by construction of obstacles in the direct path from the noise source to a receiver. These obstacles can be tightly spaced wood fences (no gaps in the wood panels), concrete fences, earth berms, structures, or naturally occurring hills. Care must be taken even with a tightly spaced wood fence. Even with a small opening between the individual slats on a fence can allow a pathway for noise to propagate through the opening. In fact, the noise can actually be enhanced through a small opening because the noise energy is channeled through the opening. To mitigate this problem, wood fences are generally constructed with two faces with the slats on one face overlapping the adjacent face.				

Table A–2 Potential Mitigation Measures from the FEIS, Agency Authorities, and Responsibilities

Mitigation Measure	Authority/Responsibility			
	BLM	FS	Wyoming	Other
79. During construction, emissions of particulate matter from well pad and resource road construction will be minimized by application of water, or other dust suppressants, with at least 50 percent control efficiency. Roads and well locations constructed on soils susceptible to wind erosion could be appropriately surfaced or otherwise stabilized to reduce the amount of fugitive dust generated by traffic or other activities, and dust inhibitors (surfacing materials, non-saline dust suppressants, and water) could be used as necessary on unpaved collector, local and resource roads that present a fugitive dust problem. The use of chemical dust suppressants on BLM surface will require prior approval form the BLM authorized officer.	✓	✓	✓	
➢ A variety of potential emission reduction measures (BLM 1999d) are available to further limit NO_x and other air pollutant emissions. The evaluation was not intended to rank or identify a required emission reduction measure; the appropriate level of control will be determined and required by the applicable air quality regulatory agencies during the pre-construction permit process.			✓	
80. Table A–3 and Table A–4 below present mitigation options for particulate matter and nitrogen oxide emissions.			✓	

Notes:
1 – Montana DEQ
2 – U.S. Army Corp of Engineers
3 – U.S. Fish and Wildlife Service
4 – Campbell, Sheridan, Johnson and Converse Counties
* Mitigation measures not accepted. For rationale, see that section.

A.3 Management Actions

Authorization of multiple or single oil and gas related actions (for example, road construction, well pad construction and drilling, pipeline construction, and production facility installation) will require the responsible Operator to prepare and submit various applications/plans to the BLM Buffalo or Casper Field Managers. The application/plan may cover planned multiple field actions (for example, PODs or cover a single field action for one well pad or access road. BLM will require that CBM projects be submitted as PODs. A POD is a group of wells and their supporting infrastructure (such as, roads, pipelines, power lines, water discharge points, booster stations, and compressor stations) for a geographic area or sub-watershed. The POD helps the operators develop a logical, economical, environmentally sound CBM project that the BLM can efficiently process and approve.

These approved applications/plans will serve as the Operator's field operations guide, a copy of which will be kept on-site and in the office of the Operator. The applications/plans are as follows:

- ü Application for Permit to Drill;
- ü Right-of-way Application;
- ü Cultural Clearance Reports (Class I/III);

At a minimum, all areas of proposed ground disturbing activity would be intensively inventoried for cultural resources in conformance with minimal BLM Class III survey standards at the APD, POD or Sundry Notice phase of each proposed Federal undertaking. For CBM well fields or PODs, a block survey of the entire project area early in the planning phase is highly recommended by the BLM and is required by the FS. All sites within the proposed project area must be evaluated for eligibility to the NRHP.

Specific plans for avoidance and protection or minimization of adverse direct or indirect effects would be recommended for any historic properties within the areas of potential effect of proposed project activities. Prior to implementation, these plans must be approved by the BLM or FS, as appropriate, SHPO, and, if applicable, by the private surface owner. Such plans might include, but are not limited to the following constraints, stipulations, or actions:

- ü Relocation, redesign or constraint of project facilities and infrastructure to avoid or minimize earth disturbance within historic properties or contributing portions of historic properties, or to avoid or minimize indirect effects or intrusions caused by vibration, dust, exhaust, or noise. This may include barricading or fencing of sensitive areas and buffer zones.
- ü Relocation, redesign, or constraint of project facilities and infrastructure to avoid or minimize visual intrusion on a sensitive historic, traditional, or religious setting. This might include low profile facilities, non-intrusive colors, landscaping, berms, screening with vegetation, or other measures to minimize visual impact.

- ü Stabilization of sediments, bedrock, or structures that could be destabilized, or could deteriorate, as a result of nearby project activities and identification of an appropriate buffer zone.
- ü Restriction or prevention of access to sensitive areas.
- ü Rehabilitation of buildings or structures, or protective screening of art work to minimize deterioration.
- ü Detailed documentation, possibly including archival photodocumentation, of contributing structures, landscape features, or aspects of historic setting that cannot feasibly be avoided. In some cases it may be feasible to restore some of these contributing features after construction has been completed.
- ü Detailed recordation or data recovery of the essential contributing elements of a historic property that cannot be avoided or protected. Recordation may include archival, documentary, and contextual research related to the historic property in addition to site documentation. Data recovery is the systematic recovery of data important in history or prehistory for which the property is considered eligible. Data recovery for prehistoric or historic archaeological sites typically entails excavation of buried materials and detailed documentation of stratigraphic context.

Water Management Plan

A WMP is required to be submitted with CBM APDs or PODs. The operator shall provide a comprehensive WMP that addresses the handling of produced water during the testing and production of CBM well(s). The WMP must provide adequate information for the BLM to complete site-specific NEPA analysis and to ensure compliance with all state and federal requirements prior to approval. A CBM APD/POD will not be considered complete by BLM unless it contains a WMP. For details on WMP's see Appendix D.

Integrated Pest Management Plan

The Integrated Pest Management Plan (IPMP) will be required to be submitted with the APD/POD if wells/facilities fall within an area of identified noxious weeds. For details on IPMP's see Appendix F.

Reclamation Plan

Phased reclamation plans will be submitted to the BFO and CFO for approval prior to individual POD facility abandonment. These plans will be submitted as a notice of intent (NOI) Sundry Notice for individual facilities, such as well locations, pipelines, discharge points, impoundments , as they are no longer needed. Details are contained under Section A.4.1 of Appendix A, Standard Condition of Approval # 7.

Surface use Data Summary Form

Companies must submit a Surface Use Data Summary form as part of every POD Master Surface Use Plan and subsequent Sundry Notices involving surface disturbing activities. This form is available in the CBM guidebook.

A.4 Standard Conditions of Approval

Standard Conditions of Approval are those measures that apply to all oil and gas development. These conditions are applied to both APD and SN when they are not specifically addressed in those plans by the Companies. There are standard conditions of approval that apply only to CBM activities and others that apply to both conventional oil and gas and CBM activities. Section A.4.1 identifies standard conditions of approval applicable to development involving only coal bed methane. Section A.4.2 identifies standard conditions of approval that are pertinent to all federal oil & gas lease development. Not all of the conditions in this second section are applicable to development of CBM.

It is important to note that site-specific mitigation measures are also developed by the BLM authorized officer, as needed, on a case-by-case basis at the onsite inspection to address special, unanticipated issues not addressed by a programmatic mitigation measure or standard conditions of approval (e.g., erosive soils, steep slopes, proximity to existing improvements, etc.).

A.4.1 Section 1 — Applicable to Coal Bed Methane Well Development Only

1. A pre-construction field meeting shall be conducted prior to beginning any dirt work approved under this POD. The operator shall contact the BLM Authorized Officer (responsible NRS @ 307-684-1100) at least 4-days prior to beginning operations so that the meeting can be scheduled. The operator is responsible for having all contractors present (dirt contractors, drilling contractor, pipeline contractor, project oversight personnel, etc.) including the overall field operations superintendent, and for providing all contractors copies of the approved POD, project map and BLM *Conditions of Approval* pertinent to the work that each will be doing.
2. Reserve pits will be adequately fenced during and after drilling operations until pit is reclaimed so as to effectively keep out wildlife and livestock. Adequate fencing, in lieu of more stringent requirements by the surface owner, is defined as follows:

    - Construction materials will consist of steel or wood posts. Three or four strand wire (smooth or barbed) fence or hog panel (16-foot length by 50-inch height) or plastic snow fence must be used with connectors such as fence staples, quick-connect clips, hog rings, hose clamps, twisted wire, etc. Electric fences will not be allowed.
    - Construction standards: Posts shall be firmly set in ground. If wire is used it must be taut and evenly spaced, from ground level to top wire, to effectively keep out animals. Hog panels must be tied securely into posts and one another using fence staples, clamps, etc. Plastic snow fencing must be taut and sturdy. Fence must be at least 2-feet from edge of pit. 3 sides fenced before beginning drilling, the fourth side fenced immediately upon completion of drilling and prior to rig release. Fence must be left up and maintained in adequate condition until pit is closed.

3. Reserve pits will be closed as soon as possible, but no later than 90 days from time of drilling/well completion, unless the BLM Authorized Officer gives an extension. Squeezing of pit fluids and cuttings is prohibited. Pits must be dry of fluids or they must be removed via vac truck or other environmentally acceptable method prior to backfilling, recontouring and replacement of topsoil. Mud and cuttings left in pit must be buried at least 3-feet below recontoured grade. The operator will be responsible for recontouring any subsidence areas that develop from closing a pit before it is sufficiently dry.
4. The operator shall complete wells (case, cement and under ream) as soon as possible, but no later than 30 days after drilling operations, unless an extension is given by the BLM Authorized Officer.
5. If in the process of air drilling the wells there is a need to utilize mud, all circulating fluids will be contained either in an approved pit or in an aboveground containment tank. The pit or containment tank will be large enough to safely contain the capacity of all expected fluids without danger of overflow. Fluid and cuttings will not be squeezed out of the pit, and the pit will be reclaimed in an expedient manner.
6. The operator shall restrict travel on unimproved two-track roads during periods of inclement weather or spring thaw when the possibility exists for excessive surface resource damage (e.g., rutting in excess of 4-inches, travel outside two-track roadway, etc.).
7. Phased reclamation plans will be submitted to BLM for approval prior to individual POD facility abandonment via a Notice of Intent (NOI) Sundry Notice. Individual facilities, such as well locations, pipelines, discharge points, impoundments, etc. need to be addressed in these plans as they are no longer needed. Individual items that will need to be addressed in reclamation plans include:

    - Pit closure (Close ASAP after suitably dry, but no later than 90 days from time of drilling unless an extension is given by BLM Authorized Officer.) BLM may require closure prior to 90 days in some cases due to land use or environmental concerns.
    - Configuration of reshaped topography, drainage systems, and other surface manipulations
    - Waste disposal
    - Revegetation methods, including specific seed mix (pounds pure live seed/acre) and soil treatments (seedbed preparation, fertilization, mulching, etc.). On private surface, the landowner should be consulted for the specific seed mix.
    - Other practices that will be used to reclaim and stabilize all disturbed areas, such as water bars, erosion fabric, hydro-mulching, etc.
    - An estimate of the timetables for beginning and completing various reclamation operations relative to weather and local land uses.
    - Methods and measures that will be used to control noxious weeds, addressing both ingress and egress to the individual well or POD.
    - Decommissioning/removal of all surface facilities

- ∉ Closure and reclamation of areas utilized or impacted by produced CBM water, including discharge points, reservoirs, off-channel pits, land application areas, livestock/wildlife watering facilities, surface discharge stream channels, etc

8. The first well drilled to each targeted coal zone will be designated as the POD reference well. Designated reference wells must have the ability to be sampled at the wellhead. Water quality samples will be collected by the operator and submitted for analysis using WDEQ NPDES criteria within 30-60 days of initial water production. Results of the analysis will be submitted to the BFO-BLM Authorized Officer as soon as they become available.

A.4.2 Section 2 — Pertinent to All Oil and Gas Well Development

A.4.2.1 General

1. If any cultural values [sites, artifacts, human remains (Appendix L FEIS)] are observed during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. The authorized officer will conduct an evaluation of the cultural values to establish appropriate mitigation, salvage or treatment. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is to immediately stop work that might further disturb such materials, and contact the authorized BLM officer (AO). Within five working days the AO will inform the operator as to:

   - ∉ whether the materials appear eligible for the National Register of Historic Places;
   - ∉ the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and,
   - ∉ a time-frame for the AO to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction measures.

2. If paleontological resources, either large or conspicuous, and/or a significant scientific value are discovered during construction, the find will be reported to the Authorized Officer immediately. Construction will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM approved professional paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological values. Operations within 250 feet of such a discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The applicant

will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operation.

3. Please contact (pertinent NRS), Natural Resource Specialist, @ (307) 684-1100, Bureau of Land Management, Buffalo, if there are any questions concerning the following surface use COAs.

A.4.2.2 Construction

1. The operator will limit vegetation removal and the degree of surface disturbance wherever possible. Where surface disturbance cannot be avoided, all practicable measures will be utilized to minimize erosion and stabilize disturbed soils.
2. Construction and drilling activity will not be conducted using frozen or saturated soil material during periods when watershed damage or excessive rutting is likely to occur.
3. Remove all available topsoil (depths vary from 4 inches on ridges to 12+ inches in bottoms) from constructed well locations including areas of cut and fill, and stockpile at the site. Topsoil will also be salvaged for use in reclamation on all other areas of surface disturbance (roads, pipelines, etc.). Clearly segregate topsoil from excess spoil material. Any topsoil stockpiled for one year or longer will be signed and stabilized with annual ryegrass or other suitable cover crop.
4. The operator will not push soil material and overburden over side slopes or into drainages. All soil material disturbed will be placed in an area where it can be retrieved without creating additional undue surface disturbance and where it does not impede watershed and drainage flows.
5. Construct the backslope no steeper than ½:1, and construct the foreslope no steeper than 2:1, unless otherwise directed by the BLM Authorized Officer.
6. Maintain a minimum 20-foot undisturbed vegetative border between toe-of-fill of pad and/or pit areas and the edge of adjacent drainages, unless otherwise directed by the BLM Authorized Officer.
7. With the overall objective of minimizing surface disturbance and retaining land stability and productivity, the operator shall utilize equipment that is appropriate to the scope and scale of work being done for roads and well pads (utilize equipment no larger than needed for the job).
8. To minimize electrocution potential to birds of prey, all overhead electrical power lines will be constructed to standards identified by the Avian Power Line Interaction Committee (1996).
9. The operator shall utilize wheel trenchers or ditch witches to construct all pipeline trenches, except where extreme topography or other environmental factors preclude their use.
10. A flare pit will be constructed on the well pad for use during drilling operations. It will be located at least 125 feet from the well head and will be located down-wind from the prevailing winds.

11. Reserve pit will be adequately fenced during and after drilling operations until reclaimed so as to effectively keep out wildlife and livestock. This requires that it be fenced on the three nonworking sides prior to drilling and on the remaining side immediately following rig release. Fencing will be constructed in accordance with BLM specifications. (Plastic snow fence is not acceptable fencing material for conventional wells.)

12. The reserve pit will be oriented to prevent collection of surface runoff. After the drilling rig is removed, the operator may need to construct a trench on the uphill side of the reserve pit to divert surface drainage around it. If constructed, the trench will be left intact until the pit is closed.

13. The reserve pit will be lined with an impermeable liner if permeable subsurface material is encountered. An impermeable liner is any liner having a permeability less than 10^{-7} cm/sec. The liner will be installed so that it will not leak and will be chemically compatible with all substances that may be put in the pit. Liners made of any man-made synthetic material will be of sufficient strength and thickness to withstand normal installation and pit use. In gravelly or rocky soils, a suitable bedding material such as sand will be used prior to installing the liner.

14. The reserve pit will be constructed so that at least half of its total volume is in solid cut material (below natural ground level).

15. Culverts will be placed on channel bottoms on firm, uniform beds, which have been shaped to accept them, and aligned parallel to the channel to minimize erosion. Backfill will be thoroughly compacted.

16. The minimum diameter for culverts will be 18 inches. However, all culverts will be appropriately sized in accordance with standards in BLM Manual 9113.

17. Construction and other project-related traffic will be restricted to approved routes. Cross-country vehicle travel will not be allowed.

18. Maximum design speed on all operator constructed and maintained roads will not exceed 25 miles per hour.

19. Pipeline construction shall not block nor change the natural course of any drainage. Pipelines shall cross perpendicular to drainages. Pipelines shall not be run parallel in drainage bottoms. Suspended pipelines shall provide adequate clearance for maximum runoff.

20. Pipeline trenches shall be compacted during backfilling. Pipeline trenches shall be routinely inspected and maintained to ensure proper settling, stabilization and reclamation.

21. During construction, emissions of particulate matter from well pad and road construction would be minimized by application of water or other non-saline dust suppressants with at least 50 percent control efficiency. Dust inhibitors (surfacing materials, non-saline dust suppressants, and water) will be used as necessary on unpaved roads that present a fugitive dust problem. The use of chemical dust suppressants on public surface will require prior approval from the BLM Authorized Officer.

22. Operators are required to obtain a National Pollution Discharge Elimination System (NPDES) Storm Water Permit from the Wyoming DEQ for any pro-

jects that disturb five or more acres (changing to one acre in March 2005). This general construction storm water permit must be obtained from WDEQ **prior** to any surface disturbing activities and can be obtained by following directions on the WDEQ website at http://deq.state.wy.us. Further information can be obtained by contacting Barb Sahl at (307) 777-7570.

23. The operator shall submit a Sundry Notice (Form 3160-5) to BLM for approval prior to construction of any new surface disturbing activities that are not specifically addressed in the approved APD or POD Surface Use Plan.

A.4.2.3 Operations/Maintenance

1. Confine all equipment and vehicles to the access road(s), pad(s), and area(s) specified in the approved APD or POD.
2. All waste, other than human waste and drilling fluids, will be contained in a portable trash cage. This waste will be transported to a State approved waste disposal site immediately upon completion of drilling operations. No trash or empty barrels will be placed in the reserve pit or buried on location. All state and local laws and regulations pertaining to disposal of human and solid waste will be complied with.
3. Rat and mouse holes shall be filled and compacted from the bottom to the top immediately upon release of the drilling rig from the location.
4. The operator will be responsible for prevention and control of noxious weeds and weeds of concern on all areas of surface disturbance associated with this project (well locations, roads, water management facilities, etc.) Use of pesticides shall comply with the applicable Federal and State laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of Interior. Prior to the use of pesticides on public land, the holder shall obtain from the BLM authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer to such use.
5. All permanent above-ground structures (e.g. , production equipment, tanks, etc.) not subject to safety requirements will be painted to blend with the natural color of the landscape. The paint used will be a color which simulates "Standard Environmental Colors." The color selected for this (site, project), is (name and Munsell Soil Color Number).
6. Sewage shall be placed in a self-contained, chemically treated porta-potty on location.
7. The operator and their contractors shall ensure that all use, production, storage, transport and disposal of hazardous and extremely hazardous materials associated with the drilling, completion and production of this well will be in accordance with all applicable existing or hereafter promulgated federal, state and local government rules, regulations and guidelines. All project-related activities involving hazardous materials will be conducted in a manner to minimize potential environmental impacts. In accordance with OSHA requirements, a file will be maintained onsite containing current Material Safety Data Sheets (MSDS) for all chemicals, compounds and/or substances

which are used in the course of construction, drilling, completion and production operations.

8. Produced fluids shall be put in test tanks on location during completion work. Produced water will be put in the reserve pit during completion work per Onshore Order #7.

9. The only fluids/waste materials which are authorized to go into the reserve pit are RCRA exempt exploration and production wastes. These include:

   - drilling muds & cuttings
   - rigwash
   - excess cement and certain completion & stimulation fluids defined by EPA as exempt

   It does not include drilling rig waste, such as:

   - spent hydraulic fluids
   - used engine oil
   - used oil filter
   - empty cement, drilling mud, or other product sacks
   - empty paint, pipe dope, chemical or other product containers
   - excess chemicals or chemical rinsate

   Any evidence of non-exempt wastes being put into the reserve pit may result in the BLM Authorized Officer requiring specific testing and closure requirements.

10. Operators are advised that prior to installation of any oil and gas well production equipment which has the potential to emit air contaminants, the owner or operator of the equipment must notify the Wyoming Department of Environmental Quality, Air Quality Division (phone 307-777-7391) to determine permit requirements. Examples of pertinent well production equipment include fuel-fired equipment (e.g., diesel generators), separators, storage tanks, engines and dehydrators.

11. If this well is drilled during the fire season (June-October), the operator shall institute all necessary precautions to ensure that fire hazard is minimized, including but not limited to mowing vegetation on the access route(s) and well location(s), keeping fire fighting equipment readily available when drilling, etc.

A.4.2.4 Dry Hole/Reclamation

1. All disturbed lands associated with this project, including the pipelines, access roads, water management facilities, etc will be expediently reclaimed and reseeded in accordance with the surface use plan and any pertinent site-specific COAs.

2. Disturbed lands will be recontoured back to conform with existing undisturbed topography. No depressions will be left that trap water or form ponds.

3. The fluids and mud must be dry in the reserve pit before recontouring pit area. The operator will be responsible for recontouring of any subsidence areas that develop from closing a pit before it is completely dry. The plastic pit

liner (if any) will be cut off below grade and properly disposed of at a state authorized landfill before beginning to recontour the site.

4. Before the location has been reshaped and prior to redistributing the topsoil, the operator will rip or scarify the drilling platform and access road on the contour, to a depth of at least 12 inches. The rippers are to be no farther than 24 inches apart.

5. Distribute the topsoil evenly over the entire location and other disturbed areas. Prepare the seedbed by disking to a depth of 4-to-6 inches following the contour.

6. Waterbars are to be constructed at least one (1) foot deep, on the contour with approximately two (2) feet of drop per 100 feet of waterbar to ensure drainage, and extended into established vegetation. All waterbars are to be constructed with the berm on the downhill side to prevent the soft material from silting in the trench. The initial waterbar should be constructed at the top of the backslope. Subsequent waterbars should follow the following general spacing guidelines:

Slope (percent)	Spacing Interval (feet)
Ò2	200
2 – 4	100
4 – 5	75
Ó5	50

7. The operator will drill seed on the contour to a depth of 0.5 inch, followed by cultipaction to compact the seedbed, preventing soil and seed losses. To maintain quality and purity, the current years tested, certified seed with a minimum germination rate of 80% and a minimum purity of 90% will be used. On BLM surface or in lieu of a different specific mix desired by the surface owner, use the following:

SPECIES-CULTIVAR **LBS PLS/ACRE**
(To be determined at the site-specific onsite inspection)

Slopes too steep for machinery may be hand broadcast and raked with twice the specified amount of seed. Complete fall seeding after September 15 and prior to prolonged ground frost. To be effective, complete spring seeding after the frost has left the ground and prior to May 15.

8. BLM will not release the performance bond until the area has been successfully revegetated (evaluation will be made after the second complete growing season) and has met all other reclamation goals of the surface owner and surface management agency.

9. A Notice of Intent to Abandon and a Subsequent Report of Abandonment must be submitted for abandonment approval.

10. For performance bond release approval, a Final Abandonment Notice (with a surface owner release letter on split-estate) must be submitted prior to a final abandonment evaluation by BLM.

11. Soil fertility testing and the addition of soil amendments may be required to stabilize some disturbed lands.
12. Any mulch utilized for reclamation needs to be certified weed free.

A.4.2.5 Producing Well

1. Landscape those areas not required for production to the surrounding topography as soon as possible. The fluids and mud must be dry in the reserve pit before recontouring pit area. The operator will be responsible for recontouring and reseeding of any subsidence areas that develop from closing a pit before it is completely dry.
2. Reduce the backslope to 2:1 and the foreslope to 3:1, unless otherwise directed by the BLM Authorized Officer. Reduce slopes by pulling fill material up from foreslope into the toe of cut slopes.
3. Production facilities (including dikes) must be placed on the cut portion of the location and a minimum of 15 feet from the toe of the back cut unless otherwise approved by the BLM Authorized Officer.
4. A dike will be constructed completely around the production facilities (i.e. production tanks, water tanks, and heater-treater). The dikes for the production facilities must be constructed of impermeable soil, hold 110% of the capacity of the largest tank plus 1-foot of freeboard, and be independent of the back cut.
5. Any chemicals used in treating the wells (e.g., corrosion inhibitor, emulsion breaker, etc.) will be in a secure, fenced-in area with appropriate secondary containment structure (dikes, catchment pan, etc.).
6. The load out line coming from the oil/condensate tank(s) will have a suitable containment structure to capture and recycle any oil spillage that might occur.
7. Individual production facilities (tanks, treaters, etc.) will be adequately fenced off (if entire facility not already fenced off).
8. Any spilled or leaked oil, produced water or treatment chemicals must be reported in accordance with NTL-2A and immediately cleaned up in accordance with BLM requirements. This includes clean-up and proper disposition of soils contaminated as a result of such spills/leaks.
9. Distribute stockpiled topsoil evenly over those areas not required for production and reseed as recommended.
10. Upgrade and maintain access roads and drainage control (e.g., culverts, drainage dips, ditching, crowning, surfacing, etc.) as necessary and as directed by the BLM Authorized Officer to prevent soil erosion and accommodate safe, environmentally-sound access.
11. Prior to construction of production facilities not specifically addressed in the APD/POD, the operator shall submit a Sundry Notice to the BLM Authorized Officer for approval.
12. If not already required prior to constructing and drilling the well location, the operator shall immediately upgrade the entire access road to BLM standards

(including topsoiling, crowning, ditching, drainage culverts, surfacing, etc.) to ensure safe, environmentally-sound, year-round access.

14. Waterbars shall be installed on all reclaimed pipeline corridors per the guidelines in A.4.2.4 #6...

A.5 Programmatic Mitigation

Programmatic mitigation measures are those, determined through analysis, which may be appropriate to apply at the time of APD approval if site specific conditions warrant. These mitigation measures can be applied by BLM, as determined necessary at the site-specific NEPA APD stage, as *Conditions of Approval* (COAs) and will be in addition to stipulations applied at the time of lease issuance and any standard conditions of approval.

A.5.3 Groundwater

1. Concerns exist about the interaction between reservoirs and shallow groundwater. At impoundment locations, it may be necessary to conduct investigations at representative sites around the basin to quantify impacts of water infiltration and lateral movement. Shallow groundwater wells will be installed in cooperation with the operator and regularly sampled in areas where it has been determined during pre-construction that class 1 groundwater may be affected by infiltration or potential for lateral movement exists.

A.5.4 Surface Water

1. Locate discharge points in areas that will minimize erosion and impacts to the receiving channel, existing improvements, and downstream users.
2. Locate discharge points in stable, low gradient drainage systems and below active headcuts, when possible. If discharge is located above a Headcut, mitigation measures will be required by the BLM Authorized Officer on a site specific basis. Some mitigation measures will require engineering design.
3. All discharge points will require energy dissipation measures.
4. Discharge points may not be authorized by BLM regardless of NPDES status or previous use. Sites may be moved or otherwise mitigated by the BLM Authorized Officer during onsite inspections where environmental issues exist.
5. Cumulative produced water discharge must not exceed the naturally occurring 2 year peak flow of the receiving channel.
6. Discharge Points will not be located in playas or enclosed basins unless it can be demonstrated that it can be done without resulting in adverse impacts. Discharges into valley bottoms with no defined low-flow channel will generally not be allowed, but will be reviewed on a site-specific basis.
7. Channel Crossings:
   - ∉ Minimize channel disturbance as much as possible by limiting pipeline and road crossings.

- ∉ Avoid running pipelines and access roads within floodplains or parallel to a stream channel.
- ∉ Channel crossings by road and pipelines will be constructed perpendicular to flow. Culverts will be installed at appropriate locations for streams and channels crossed by roads as specified in the BLM Manual 9112-Bridges and Major Culverts and Manual 9113-Roads. Streams will be crossed perpendicular to flow, where possible, and all stream crossing structures will be designed to carry the 25-year discharge event or other capacities as directed by the BLM.
- ∉ Channel crossings by pipelines will be constructed so that the pipe is buried at least four feet below the channel bottom.

8. Low water crossings will be constructed at original streambed elevation in a manner that will prevent any blockage or restriction of the existing channel. Material removed will be stockpiled for use in reclamation of the crossings.
9. Concerns regarding the quality of the discharged CBM water on downstream irrigation use may require operators to increase the amount of storage of CBM water during the irrigation months and allow more surface discharge during the non-irrigation months.
10. The BLM will consult with appropriate state agencies regarding West Nile Virus. If determined to be necessary, a condition of approval will be applied at the time of APD approval to treat mosquitoes for any CBM discharge waters that become stagnant.

A.5.5 Soils

1. The Companies, on a case by case basis depending upon water and soil characteristics, will test sediments deposited in impoundments before reclaiming the impoundments. Tests will include the standard suite of cations, ions, and nutrients that will be monitored in surface water testing and any trace metals found in the CBM discharges at concentrations exceeding detectable limits.
   - ∉ Areas of highly erosive soils will be avoided when drill sites, two-track access routes, and pipeline routes are surveyed and staked in order to substantially reduce the amount of soil loss.
2. Where feasible, gas and water pipelines and electrical cables will be installed in disturbance corridors. Disturbance corridors combine two or more utility lines (water, gas, electric) in common trenches, usually within access roadways.

A.5.6 Cultural Resources

1. The Companies will conduct development in and around the Crazy Woman Battlefield in a way that preserves the eligibility of the site for nomination to the National Register of Historic Places. Approvals of APDs and PODs will require prior coordination with the SHPO and BLM's archaeologists.
2. For development within 0.25 mile either side of the Bozeman Trail, companies will conduct evaluation of segments to determine their eligibility to the

National Register of Historic Places. Mitigation of adverse impacts to segments of the trail that contribute to its eligibility for the NRHP will be determined on a case-by-case basis.

A.5.7 Vegetation

1. Weed educational material will be reviewed with operators during pre-construction on-site meetings with operators, subcontractors, and landowners and will also be attached to approved APDs and PODs.
2. Temporarily fence reseeded areas, if not already fenced, for at least two complete growing seasons to insure reclamation success on problematic sites (e.g. close to livestock watering source, erosive soils etc.).

A.5.8 Wetland/Riparian

1. To protect the biological and hydrologic features of riparian areas, woody draws, wetlands, and floodplains, all well pads, compressors, and other non-linear facilities will be located outside of these areas.
2. To reduce adverse effects on existing wetlands and riparian areas, water discharge should not be allowed if increased discharge volumes or subsequent recharge of shallow aquifers will inundate and kill woody species, such as willows or cottonwoods.
3. For any jurisdictional wetlands identified that may be impacted, a detailed mitigation plan will be developed during the APD/POD or sundry notice approval process. Federal requirements to replace all impacted wetlands will mitigate this loss, so environmental impacts will occur only during the life of the project (including reclamation).
4. Any fences used in wetland areas should be placed well back from the wetlands to prevent waterfowl mortalities and should be constructed to standards that allow big game movement.
5. Crossings of wetland/riparian areas by linear features, such as pipelines, roads, and power lines will be avoided to the extent practicable. Where crossings cannot be avoided, impacts will be minimized through use of the following measures:
   - ü Site-specific mitigation plans will be developed during the APD, POD, or Sundry Notice approval process for all proposed disturbance to wetland/riparian areas.
   - ü Crossings will be constructed perpendicular to wetland/riparian areas, where practical.
   - ü Power line corridors will avoid wetlands, to the extent possible, in order to reduce the chance of waterfowl hitting the lines. Where avoidance can't occur, the minimum number of poles necessary to cross the area will be used.
   - ü Wetland areas will be disturbed only during dry conditions (that is, during late summer or fall), or when the ground is frozen during the winter.

- ü No waste material will be deposited below high water lines in riparian areas, flood plains, or in natural drainage ways.
- ü The lower edge of soil or other material stockpiles will be located outside the active floodplain.
- ü Drilling mud pits will be located outside of riparian areas, wetlands, and floodplains, where practical.
- ü Disturbed channels will be re-shaped to their approximate original configuration or stable geomorphological configuration and properly stabilized.
- ü Reclamation of disturbed wetland/riparian areas will begin immediately after project activities are complete.

A.5.9 Wildlife

1. For any surface-disturbing activities proposed in sagebrush shrublands, the Companies will conduct clearance surveys for sage grouse breeding activity during the sage grouse's breeding season before initiating the activities. The surveys must encompass all sagebrush shrublands within 0.5 mile of the proposed activities.
2. The Companies will locate compressor stations so that noise from the stations at any nearby sage grouse or sharp-tailed grouse display grounds does not exceed 49 decibels (10 dBA above background noise) at the display ground.
3. The Companies will construct power lines to minimize the potential for raptor collisions with the lines. Potential modifications include burying the lines, avoiding areas of high avian use (for example, wetlands, prairie dog towns, and grouse leks), and increasing the visibility of the individual conductors.
4. The Companies will locate aboveground power lines, where practical, at least 0.5 mile from any sage grouse breeding or nesting grounds to prevent raptor predation and sage grouse collision with the conductors. Power poles within 0.5 mile of any sage grouse breeding ground will be raptor-proofed to prevent raptors from perching on the poles.
5. The Companies will locate impoundments to avoid sagebrush shrublands, where practical.
6. Containment impoundments will be fenced to exclude wildlife and livestock. If they are not fenced, they will be designed and constructed to prevent entrapment and drowning.
7. The Companies will limit the construction of aboveground power lines near streams, water bodies, and wetlands to minimize the potential for waterfowl colliding with power lines.

A.5.10 Aquatics Species

1. In ponds developed where the primary objective is as a fishery, water quality will be sampled by the Companies on an annual basis for selenium, TDS, salinity, temperature, pH, dissolved oxygen, and sodium bicarbonate.

2. The Companies will fence impoundments in areas that are developed for fisheries to exclude livestock, if agreed upon with the landowner.

A.5.11 Threatened, Endangered, or Sensitive Species

1. The Companies will conduct clearance surveys for threatened, endangered or other special-concern species at the optimum time. Inventory for special concern species, other than federally listed species below, is contingent upon landowner concurrence. This will require coordination with the BLM before November 1 annually to review the potential for disturbance and to agree on inventory parameters.

A.5.11.6 Bald Eagle

1. In the event that a bald eagle (dead or injured) is located during construction or operation, the USFWS' Wyoming Field Office (307-772-2374) and the USFWS' Law Enforcement Office (307-261-6365) will be notified within 24 hours.
2. Site-specific project areas will be evaluated for suitable bald eagle nesting and roosting habitat prior to permit approval. Suitable nesting habitat is any mature stand of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes or any significant body of water. Suitable roosting habitat is defined as any mature stands of conifer or cottonwood trees.
3. The BLM will monitor all take of bald eagle habitat associated with the preferred alternative. The actual measurement of disturbed habitat is the responsibility of BLM but can be delegated to BLM' agent (consultant, contractor, etc.) A written summary will be provided to the USFWS' Wyoming Field Office semi-annually. The semi-annual report will include field survey reports for endangered, threatened, proposed and candidate species for all actions covered under the *Environmental Impact Statement (EIS) for the Powder River Basin Oil and Gas Project* and ROD. The semi-annual reports will include all actions completed up to 30 days prior to the reporting dates. The first report will be due 6 months after the signing of the ROD and on the anniversary date of the signing of the ROD. Reporting will continue for the life of the project.
4. The BLM will monitor all road-associated carcasses, jackrabbit sized and larger, along project (operator-maintained) roads.
5. All power lines will be built to protect raptors, including wintering bald eagles, from accidental electrocution using methods detailed by the Avian Power Line Interaction Committee (1996).
6. Special habitats for raptors, including wintering bald eagles, will be identified and considered during the review of the APD/POD or Sundry Notices.
7. Surveys for active bald eagle nests and winter roost sites will be conducted within suitable habitat by a BLM approved biologist. Surface disturbing activities will not be permitted within one mile of suitable habitat prior to survey completion.

8. A minimum disturbance-free buffer zone of 0.5 mile (i.e., no surface occupancy) will be established year-round for all bald eagle nest sites. A seasonal minimum disturbance-free buffer zone of one mile will be established for all bald eagle nest sites (February 15 – August 15).
9. A seasonal minimum disturbance-free buffer zone of 1 mile will be established for all bald eagle winter roost sites (November 1 – April 1). These buffer zones and timing may be adjusted based on site-specific information through coordination with, and written approval from, the USFWS.
10. Within ½ mile of bald eagle winter roost sites additional measures such as remote monitoring and restricting maintenance visitation to between 9:00 and 3:00 may be necessary to prevent disturbance (November 1 – April 1).
11. Additional mitigation measures may be necessary if the site-specific project is determined by a BLM biologist to have adverse effects to bald eagles or their habitat.

A.5.11.7 Black-footed Ferret

1. Site-specific project areas will be evaluated for suitable black-footed ferret habitat prior to permit approval. Suitable habitat consists of a black-tailed prairie dog town or complex greater than 80 acres (USFWS 1989). A prairie dog town is a group of intact prairie dog holes whose density exceeds 8 burrows/acre; a complex consists of two or more neighboring prairie dog towns each less than 4.34 miles (7 kilometers) from the other (USFWS 1989).
2. Prairie dog colonies will be avoided wherever possible.
3. If suitable prairie dog colonies cannot be avoided, surveys will be conducted in compliance with the USFWS guidelines (USFWS 1989). The entire colony or colony complex affected will be surveyed, even if part of the colony has a burrow density below eight per acre.
4. If any black-footed ferrets are located, the USFWS will be consulted. Absolutely no disturbance will be allowed within prairie dog colonies inhabited by black-footed ferrets.
5. Additional mitigation measure may be necessary if the site-specific project is determined by a BLM biologist to have adverse effects to black-footed ferrets or their habitat. In the event that a mountain plover is located during construction or operation, the USFWS' Wyoming Field Office (307-772-2374) and the USFWS' Law Enforcement Office (307-261-6365) will be notified within 24 hours.

A.5.11.8 Mountain Plover

1. Site-specific project areas will be evaluated for suitable mountain plover nesting habitat prior to permit approval. Flat areas of short-grass prairie or low shrubs with a prevalence of bare ground characterize suitable mountain plover nesting habitat. Typically the vegetation height is less than 4 inches, and bare ground is greater than 30 percent. In the event that a mountain plover is located during construction or operation, the USFWS' Wyoming Field Office (307-772-2374) and the USFWS' Law Enforcement Office (307-261-6365) will be notified within 24 hours.

2. The BLM will monitor all take of mountain plover habitat associated with the preferred alternative. The actual measurement of disturbed habitat is the responsibility of BLM but can be delegated to BLM' agent (consultant, contractor, etc.) A written summary will be provided to the USFWS' Wyoming Field Office semi-annually. The semi-annual report will include field survey reports for endangered, threatened, proposed and candidate species for all actions covered under the *Environmental Impact Statement (EIS) for the Powder River Basin Oil and Gas Project* and ROD. The semi-annual reports will include all actions completed up to 30 days prior to the reporting dates. The first report will be due 6 months after the signing of the ROD and on the anniversary date of the signing of the ROD. Reporting will continue for the life of the project.
3. No ground-disturbing activities will occur in suitable nesting habitat prior to surveys for nesting mountain plovers conducted in compliance with the USFWS' Mountain Plover Survey Guidelines (USFWS 2002). A BLM approved biologist will conduct the surveys. Once occupied mountain plover nesting habitat is located, the BLM will reinitiate section 7 consultation with the USFWS on any project-related activities proposed for such habitat. The amount and nature of ground-disturbing activities will be limited within identified nesting areas in a manner to avoid the abandonment of these areas.
4. Operators and the BLM will be provided by the USFWS with educational material illustrating and describing the mountain plover, its habitat needs, life history, threats, and gas development activities that may lead to incidental take of eggs, chicks, or adults with requirements that these materials be posted in common areas and circulated in a memorandum among all employees and service providers.
5. A disturbance-free buffer zone of 0.25 mile will be established around all mountain plover nesting locations between March 15 and July 31.
6. Project-related features that encourage or enhance the hunting efficiency of predators of mountain plover will not be constructed within ¼ mile of known mountain plover nest sites.
7. Construction of ancillary facilities (for example, compressor stations, processing plants) will not be located within ½ mile of known nesting areas. The threats of vehicle collision to adult plovers and their broods will be minimized, especially within breeding aggregation areas.
8. Where possible, roads will be located outside of plover nesting areas.
9. Work schedules and shift changes will be set to avoid the periods from 30 minutes before to 30 minutes after sunrise and sunset during June and July, when mountain plovers and other wildlife are most active.
10. The BLM will monitor all road-associated carcasses, jackrabbit sized and larger, along project (operator-maintained) roads. The presence of carrion could attract mountain plover predators.
11. Creation of hunting perches or nest sites for avian predators within 0.5 mile of identified nesting areas will be avoided by burying power lines, using the lowest possible structures for fences and other structures and by incorporating perch-inhibiting devices into their design.

12. When above ground markers are used on capped and abandoned wells they will identified with markers no taller than four feet with perch inhibiting devices on the top to avoid creation of raptor hunting perches within 0.5 mile of nesting areas.
13. Reclamation of areas of previously suitable mountain plover habitat will include the seeding of vegetation to produce suitable habitat for mountain plover.

A.5.11.9 Ute Ladies'-tresses Orchid

1. Site-specific project areas will be evaluated for suitable Ute ladies'-tresses orchid habitat prior to permit approval. Suitable habitat is characterized by moist soils near springs, lakes, or perennial streams; most occurrences are in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows in the floodplains of perennial streams (USFWS 1995).
2. Suitable habitat will be avoided wherever possible.
3. If suitable habitat for Ute ladies'-tresses cannot be avoided, surveys will be conducted in compliance with USFWS standards (USFWS 1995) by a BLM approved biologist or botanist. Surveys can only be conducted between July 20 and August 31.
4. Moist soils near wetlands, streams, lakes, or springs in the project area will be promptly revegetated if construction activities impact the vegetation in these areas. Revegetation will be designed to avoid the establishment of noxious weeds.
5. Companies operating in areas identified with weed infestations or suitable Ute ladies'- tresses orchid habitat will be required to submit an integrated pest management plan prior to APD approval. The components of the integrated pest management plans are outlined in the CBM APD and POD Preparation Guide. Mitigation will be determined on a site-specific basis and may include such measures as spraying herbicides prior to entering areas and washing vehicles before leaving infested areas. Infestation areas of noxious weeds have been identified through the county Weed and Pest Districts and are available at the Buffalo BLM office.

A.5.12 Transportation

1. The Companies will provide georeferenced spatial data depicting as-built locations of all facilities, wells, roads, pipelines, power lines, reservoirs, discharge points, and other related facilities to the BLM upon completion of POD construction and development.
2. Companies will contact the counties to pursue development of maintenance agreements to ensure county roads are adequately maintained for the projected increase in use.

A.5.13 Visual Resources

1. The Companies will complete the following measures, where practical: use existing well pads where feasible; use vegetative and topographic screening when siting well locations; avoid highwall cuts.
2. Within the designated VRM Class II corridors along Interstate 90 and State Highway 14, all project facilities on BLM surface will be screened completely from these highways or camouflaged to retain basic elements of form, line, color and texture of the landscape.
3. The Companies will mount lights at compressor stations on a pole or building and direct them downward to illuminate key areas within the facility while minimizing the amount of light projected outside the facility.
4. Use buried power lines to each well, where feasible, to reduce the linear element in the landscape.

A.5.14 Noise

1. Noise mufflers will be installed on the exhaust of compressor engines to reduce the exhaust noise.
2. Where noise impacts to existing sensitive receptors are an issue, noise levels will be required to be no greater than 55 decibels measured at a distance of one-quarter mile from the appropriate booster (field) compressor. When background noise exceeds 55dBA, noise levels will be no greater than 5dBA above background. This may require the installation of electrical compressor motors at these locations.

   Two measurements commonly used to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level (L_{eq}) and the average day/night noise level (L_{dn}). The L_{eq} is an A-weighted sound level containing the same sound energy as the instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on the length of exposure and the time of day. The L_{dn} takes into account the duration and time the noise is encountered. An additional 10 decibels on the A-weighted scale (dBA) are added to late night and early morning (10:00 p.m. to 7:00 a.m.) noise exposure levels to account for people's greater sensitivity to sound during the nighttime hours. After adjustment, the 24 hourly values are averaged to determine the L_{dn}.

   Existing literature concludes an L_{dn} of 55 dBA is equivalent to a continuous noise level of 48.6 dBA for facilities that operate at a constant level of noise (FERC 2003).

   Noise can be reduced by construction of obstacles in the direct path from the noise source to a receiver or by increasing the distance between a CBM facility and an existing noise-sensitive receptor.

A.5.15 Air Quality

A number of mitigation options for CBM are part of WDEQ's normal regulatory procedure. For instance, in the permitting of compressors, the agency always requires the application of BACT. The theory here is simply that given the air resource available, within technological and financial feasibility, the number of operations that can be allowed is maximized.

1. During construction, emissions of particulate matter from well pad and resource road construction will be minimized by application of water, or other dust suppressants, with at least 50 percent control efficiency. Roads and well locations constructed on soils susceptible to wind erosion could be appropriately surfaced or otherwise stabilized to reduce the amount of fugitive dust generated by traffic or other activities, and dust inhibitors (surfacing materials, non-saline dust suppressants, and water) could be used as necessary on unpaved collector, local and resource roads that present a fugitive dust problem. The use of chemical dust suppressants on BLM surface will require prior approval form the BLM authorized officer.

   ü A variety of potential emission reduction measures (BLM 1999d) are available to further limit NO_x and other air pollutant emissions. The evaluation was not intended to rank or identify a required emission reduction measure; the appropriate level of control will be determined and required by the applicable air quality regulatory agencies during the preconstruction permit process.

   BLM will also continue to cooperate with existing visibility and atmospheric deposition impact monitoring programs. The need for, and the design of, additional monitoring could include the involvement of the EPA Region 8 Federal Leadership Forum and applicable air quality regulatory agencies. Based upon future recommendations, operators could be required to cooperate in the implementation of a coordinated air quality monitoring program. Oil and gas lease terms (Section 6) require the lessee, within the lease rights granted, to take measures deemed necessary by the lessor for the conduct of operations in a manner that minimizes adverse impacts to air quality, as well as other resources.

2. Table A–3 and Table A–4 below present mitigation options for particulate matter and nitrogen oxide emissions.

A.5.16 Geology

Inadvertent release to the atmosphere of the methane resource will be controlled through WOGCC requirements and APD conditions of approval that address well control, casing, ventilation, and plugging procedures appropriate to site-specific CBM development plans.

Table A–3 Fugitive Dust Mitigation Measures (PM10), Effectiveness and Cost

	Dust Sources					
	Disturbed Areas	Unpaved Roads[1]				
Mitigation Options	Establish plant cover for all disturbed lands by certain time (re-vegetation)	Water roads to attain certain percent moisture[2]	Apply soil stabilizer	Set and enforce speed limit	Gravel roads	Paved road
Effectiveness	Level proportional to percentage of land cover	0 – 50% reduction in uncontrolled dust emissions	33 to 100% control efficiency	80% for 15 mph 65% for 20 mph 25% for 30 mph[3]	30% reduction	90% reduction
Estimated Cost	$/acre	$4000/mile	$2,000 to $4,000/mile per year	Unknown	$9,000/mile	$11,000 to $60,000/mile

Note:
1. Improved and County roads
2. Wetting of construction roads during the construction period. Wetting of construction roads not required for once a month maintenance trips to well pads.
3. Reductions assume 40 mile per hour base speed.

Table A–4 Nitrogen Oxides (NO_x) Mitigation Measures Efficiency

	NO_x Emissions Sources			
	Field Compressors	Sales Compressors	Temporary Diesel Generators[1]	Heavy Equipment
Mitigation Options/ Efficiency	Implement Best Available Control Technology[2] Typically results in a NO_x emission rate of about 1 g/bhp-hr	Implement Best Available Control Technology[2] Typically results in a NO_x emission rate of about 1 g/bhp-hr	Register with State; will regulate as appropriate	Voluntary use of diesel engines

Notes:
1. Wyoming is currently registering these generators to determine if NO_x emissions are significant.
2. BACT could include electric compression

A.5.17 Areas of Critical Environmental Concern

1. When APDs are received that may effect the relevance and importance criteria for potential ACEC's, the need for interim management measures will be re-evaluated and/or additional site-specific mitigation would be implemented to ensure protection of values meeting the relevance and importance criteria, FEIS Appendix R.